

ABSTRACT OF THE DISCLOSURE:

A data storage unit having a data storage layer with multiple storage areas
 having a medium disposed thereon that changes between a plurality of states for
 writing and reading information thereon includes an array of light emitters, such as
 5 laser light probes or near- field light sources, spaced in close proximity to the data
 storage layer for selectively directing light beams to the data storage layer during
 write and read phases. Data is stored by directing a first light beam to the medium to
 change to a state representative of data. Data is read by exciting the storage areas
 with a second directed light beam on the medium. Alternately, the light energy
 10 beams in the write or read phases may be generated by a near-field optical system
 generating evanescent fields. The medium generates electron-hole pairs having
 substantially different activity in each storage area, depending upon its state. The
 electron-hole pairs generate activity in a detection region in communication with the
 storage area that is measured to detect the presence of data. The detection region
 15 may comprise a semiconductor diode junction, a photoconductive region or a photo-
 luminescent region. The presence of data in the storage areas is determined by the
 number of carriers flowing across the semiconductor junction, the number of carriers
 flowing in the photoconductive regions between electrodes, or the number of
 photons generated in the detection portion of the photo-luminescent region.